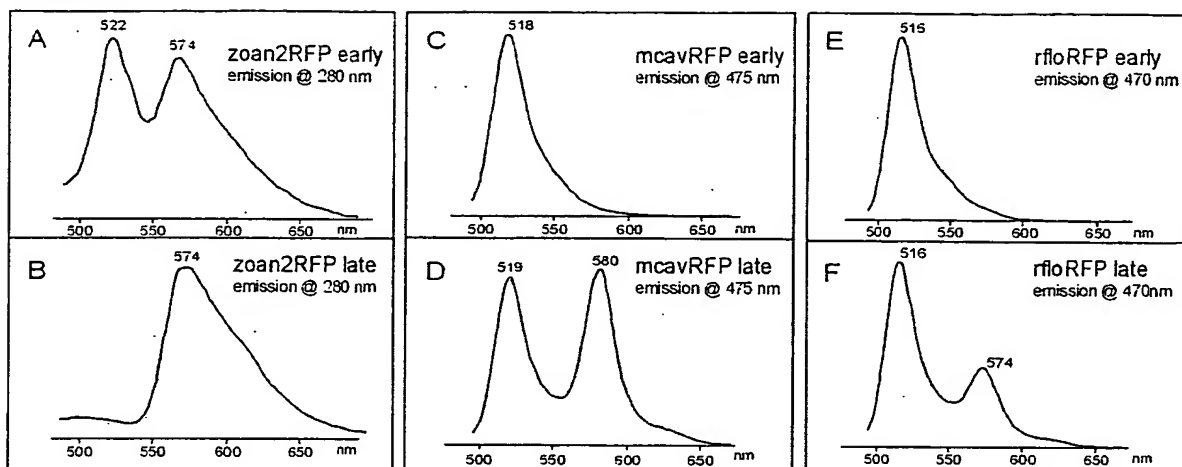


**Figure 1.**



**Figure 2.**

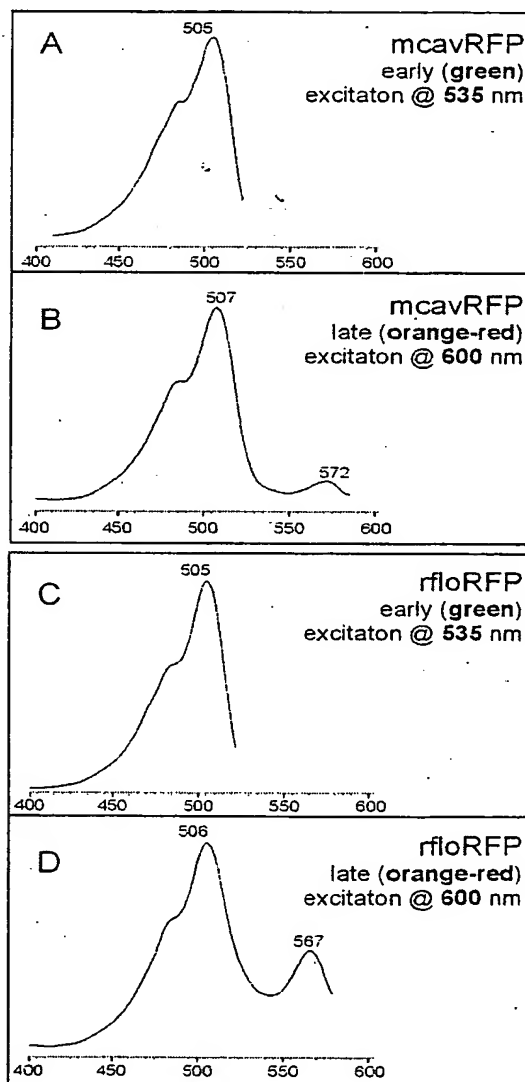


Figure 3.

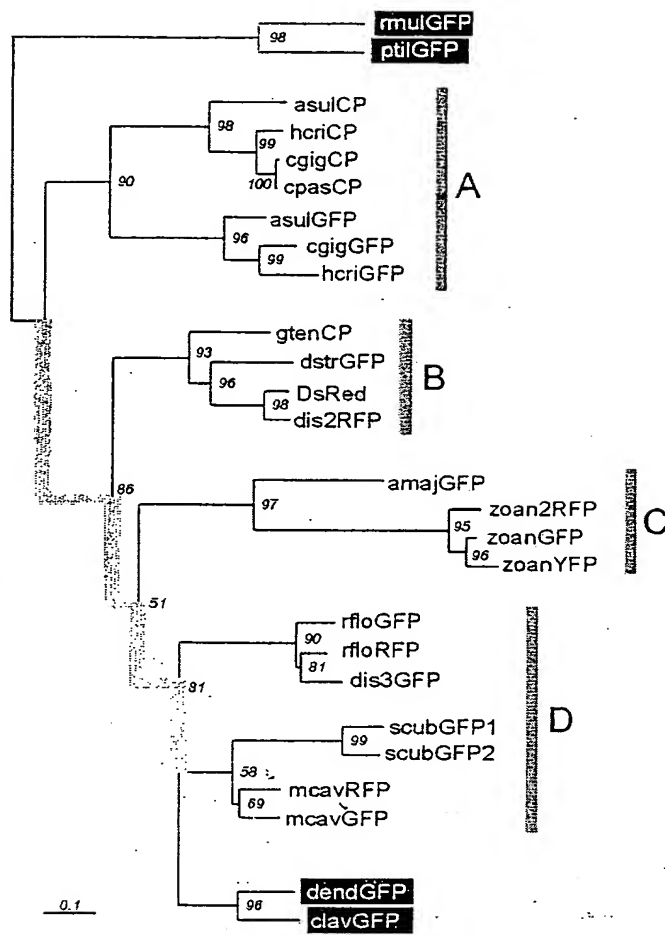


Figure 4

Protein ID (original ID)	GenBank accession #	Reference	Taxonomy  Genus species (Class, Sub-class, Order)	Excitation maxima, nm	Emission maxima, nm	Representative spectra	Color	Representative chromophore structure
amaGFP (amFP486) dsrGFP (dsFP483) clayGFP (cFP484)	AF168421 AF168420 AF168424	2 2 2	<i>Anemonia majano</i> (Anthozoa, Zoantharia, Actiniaria) <i>Discosoma striata</i> (Anthozoa, Zoantharia, Corallimorpharia) <i>Clavularia</i> sp. (Anthozoa, Aleyonaria, Aleyonacea)	458 456 443	486 484 483		GREEN	
GFP cggGFP hcfrGFP	M62653 AY037776 AF420592	34 this paper this paper	<i>Aequorea victoria</i> (Hydrozoa, ..., Hydroida) <i>Condylactis gigantea</i> (Anthozoa, Zoantharia, Actiniaria) <i>Heteractis crispus</i> (Anthozoa, Zoantharia, Actiniaria)	395, 471 399, 482 405, 481	508 498 499		YELLOW	
ptIGFP rmuIGFP zoanGFP (zFP506) asuIGFP (asFP499) dis3GFP deidGFP mcaVGFP rloGFP scubGFP1 scubGFP2	AY015995 AY015996 AF168422 AF322221 AF420593 AF420591 AY037769 AY037772 AY037767 AY037771	35 35 2 4 this paper this paper this paper this paper this paper this paper	<i>Philosorvus</i> sp. (Anthozoa, Aleyonaria, Pennatulacea) <i>Renilla muelleri</i> (Anthozoa, Aleyonaria, Pennatulacea) <i>Zoanthus</i> sp. (Anthozoa, Zoantharia, Zoanthidea) <i>Anemonia sulcata</i> (Anthozoa, Zoantharia, Actiniaria) <i>Discosoma</i> sp.3 (Anthozoa, Zoantharia, Corallimorpharia) <i>Dendronephthya</i> sp. (Anthozoa, Aleyonaria, Aleyonacea) <i>Montastraea cavernosa</i> (Anthozoa, Zoantharia, Scleractinia) <i>Ricordea florida</i> (Anthozoa, Zoantharia, Corallimorpharia) <i>Scylimna zibensis</i> (Anthozoa, Zoantharia, Scleractinia) <i>Scylimna zibensis</i> (Anthozoa, Zoantharia, Scleractinia)	500 498 496 403, 480 503 494 506 508 497 497	508 510 506 499 512 508 516 517 506 506		PURPLE-BLUE	
zoanYFP (zFP538)	AF168423	2	<i>Zoanthus</i> sp. (Anthozoa, Zoantharia, Zoanthidea)	494, 528	538		YELLOW	?
DsRed (dFP583) dis2RFP (dsFP583) zoan2RFP	AF168419 AF272711 AY059642	2 36 this paper	<i>Discosoma</i> sp.1 (Anthozoa, Zoantharia, Corallimorpharia) <i>Discosoma</i> sp.2 (Anthozoa, Zoantharia, Corallimorpharia) <i>Zoanthus</i> sp.2 (Anthozoa, Zoantharia, Zoanthidea)	558 573 553	583 693 574		ORANGE-RED	
mcaVRFP rloRFP	AY037770 AY037773	this paper this paper	<i>Montastraea cavernosa</i> (Anthozoa, Zoantharia, Scleractinia) <i>Ricordea florida</i> (Anthozoa, Zoantharia, Corallimorpharia)	507, 572 506, 567	519, 580 516, 574		ORANGE-RED	?
asuICP (asCP)	AF246709	3, 4	<i>Anemonia sulcata</i> (Anthozoa, Zoantharia, Actiniaria)	568	none		PURPLE-BLUE	
hcfrICP (hcCP) cggICP (cgCP) cpasCP (cpCP) glenCP (gCP)	AF363776 AF363775 AF363155 AF363156	5 5 5 5	<i>Heteractis crispus</i> (Anthozoa, Zoantharia, Actiniaria) <i>Condylactis gigantea</i> (Anthozoa, Zoantharia, Actiniaria) <i>Condylactis passiflora</i> (Anthozoa, Zoantharia, Actiniaria) <i>Goniopora tenuidens</i> (Anthozoa, Zoantharia, Scleractinia)	578 571 571 580	none none none none		PURPLE-BLUE	?

Table 1. Summary of spectral features and chromophore structures in the family of GFP-like proteins. Note that this paper uses different names for GFP-like proteins than proposed in original publications (the original names, where available, are given in brackets in the first column; see text for nomenclature details).

Figure 5

Table 2

clade	colors	Zoantharia orders
A	Green, purple-blue	Actiniaria
B	Green, orange-red, purple-blue	Corallimorpharia, Scleractinia
C	Green, yellow, orange-red	Actiniaria, Zoanthidea
D	Green, orange-red	Corallimorpharia, Scleractinia

Figure 6

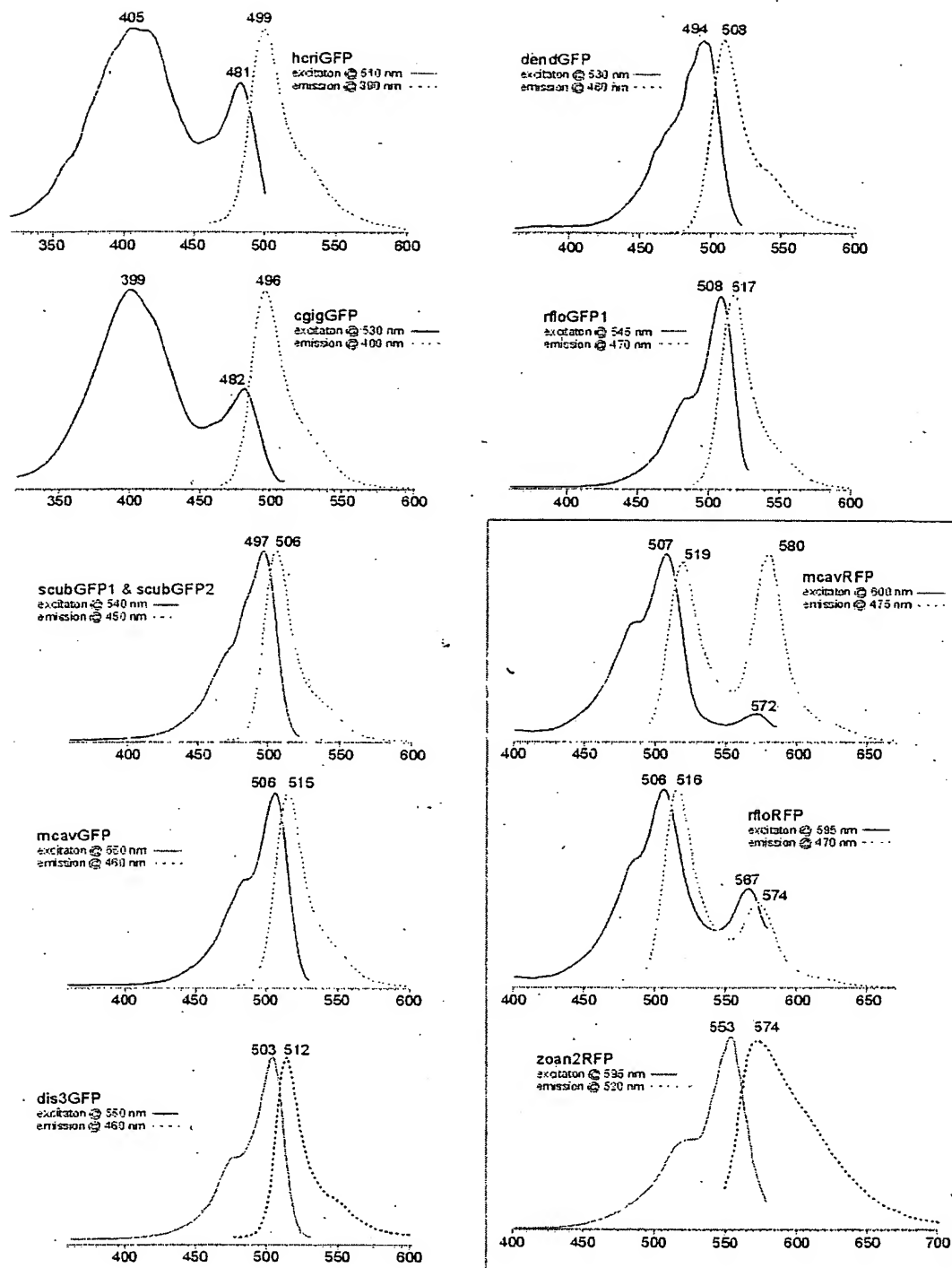


Figure 7

FIGURE 8

Green fluorescent protein from *Heteractis crispa* hcriGFP

```
      10      20      30      40      50      60
ATTTTGGACAGGTGTTCAACCAAGCAAATTTAAGAAGTCATCATCTTTATCTCAGTCAGG

      70      80      90     100     110     120
AAAATGTGTTCTTACATCAAAGAAACCATGCAAAGTAAGGTTTACATGGAAGGAAAAGTT
  M  C  S  Y  I  K  E  T  M  Q  S  K  V  Y  M  E  G  K  V

      130     140     150     160     170     180
AACGACCACAACTTCAAGTGCAGTGCAGAAAGGAGAAACCATACAAAGGCTCACAA
  N  D  H  N  F  K  C  T  A  E  G  K  G  E  P  Y  K  G  S  Q

      190     200     210     220     230     240
AGCCTGACGATCACCGTAAGTGAAGGAGGTCTCTGCCATTTGCCTTCGACATTCTTTCA
  S  L  T  I  T  V  T  E  G  G  P  L  P  F  A  F  D  I  L  S

      250     260     270     280     290     300
CACGCCTTTTCGATATGGCAATAAGGTGTTTCGCCAAGTACCCCAAAGATCATCCTGATTTT
  H  A  F  R  Y  G  N  K  V  F  A  K  Y  P  K  D  H  P  D  F

      310     320     330     340     350     360
TTTAAGCAGTCTCTTCCTGAAGGTTTTACTTGGGAAAGAGTAAGCAACTATGAGGACGGA
  F  K  Q  S  L  P  E  G  F  T  W  E  R  V  S  N  Y  E  D  G

      370     380     390     400     410     420
GGAGTCCTTACCGTTAAACAAGAACTAGTCTGGAGGGAGATTGCATTATTTGCAAATTT
  G  V  L  T  V  K  Q  E  T  S  L  E  G  D  C  I  I  C  K  I

      430     440     450     460     470     480
AAAGCACATGGCACTAACTTCCCCGCAGATGGTCCGGTGATGCAAAAACGGACCAATGGA
  K  A  H  G  T  N  F  P  A  D  G  P  V  M  Q  K  R  T  N  G

      490     500     510     520     530     540
TGGGAGCCATCAACTGAAACGGTTATTCCACGGGGTGGAGGAATTCTGATGCGCGATGTG
  W  E  P  S  T  E  T  V  I  P  R  G  G  G  I  L  M  R  D  V

      550     560     570     580     590     600
CCCGCACTGAAGCTGCTTGGTAACAAAGGACATCTTCTCTGCGTCATGGAAACAACCTTAC
  P  A  L  K  L  L  G  N  K  G  H  L  L  C  V  M  E  T  T  Y

      610     620     630     640     650     660
AAGTCAAAAAAAAAAGGTGAACCTGCCAAACCGCACTTTTCATCATTTGAGAATGGAGAAG
  K  S  K  K  K  G  E  P  A  K  P  H  F  H  H  L  R  M  E  K

      670     680     690     700     710     720
GATAGTGTTAGTGACGATGAGAAGACCATTGAGCAGCACGAGAATGTGAGGGCAAGCTAC
  D  S  V  S  D  D  E  K  T  I  E  Q  H  E  N  V  R  A  S  Y

      730     740     750     760     770     780
TTCAATGATAGTGGAATGATCATTTTCCTTATTGATTTCAATGTTAGGGCATTTCAGTTT
  F  N  D  S  G  K  *

      790     800     810     820     830     840
CCAAATTTTCTTAGACACAGTCTTTTCCTTTAGCTTCGTAGCCTACTTACCATGTTTTTG

      850     860
TTGAAGTCAATAAATAGCTAAGCACTAC (SEQ ID NOS: 01 & 02)
```

Figure 9

Green fluorescent protein from *Dendronephthya* sp. dendGFP

```

      10      20      30      40      50      60
5'CATATCGAGAAAGTTGTGAAACCAAATTCCTTACTCTACTTTTACTACCATGAATCTGATT
                                     M N L I

      70      80      90     100     110     120
AAAGAAGATATGAGGGTTAAGGTGCATATGGAAGGGAATGTAAACGGGCATGCTTTTGTG
K E D M R V K V H M E G N V N G H A F V

     130     140     150     160     170     180
ATTGAAGGGGAAGGAAAAGGAAGGCCCTACGAAGGGACACAGACCTTGAACCTGACAGTG
I E G E G K G R P Y E G T Q T L N L T V

     190     200     210     220     230     240
AAAGAAGGCGCGCCTCTCCCATTTTCTTACGACATCTTGACAACAGCATTGCACTACGGA
K E G A P L P F S Y D I L T T A L H Y G

     250     260     270     280     290     300
AACAGAGTATTCCTGAATACCCAGCAGATATCACGGATTATTTCAAGCAATCATTTTCT
N R V F T E Y P A D I T D Y F K Q S F P

     310     320     330     340     350     360
GAAGGATATTCCTGGGAAAGAACCATGACTTATGAAGACAAGGGCATTGTACCATCAGA
E G Y S W E R T M T Y E D K G I C T I R

     370     380     390     400     410     420
AGCGACATAAGCTTGGAAGGTGACTGCTTTTCCAAAACATTCGTTTTTAATGGGATGAAC
S D I S L E G D C F F Q N I R F N G M N

     430     440     450     460     470     480
TTTCCCCCAAATGGTCCAGTTATGCAGAAGAAAACTTTGAAGTGGAACCATCCACAGAG
F P P N G P V M Q K K T L K W E P S T E

     490     500     510     520     530     540
AAGCTGCACGTGCGTGATGGGTTGCTTGTCGGTAATATTAACATGGCTCTGCTGCTTGAA
K L H V R D G L L V G N I N M A L L L E

     550     560     570     580     590     600
GGAGGTGGACATTACCTGTGTGACTTCAAACTACTTACAAAGCGAAGAAGGTTGTTTCAG
G G G H Y L C D F K T T Y K A K K V V Q

     610     620     630     640     650     660
TTGCCAGATTATCATTTTGTGGACCATCGCATTGAGATCTTGAGTAATGACAGCGATTAC
L P D Y H F V D H R I E I L S N D S D Y

     670     680     690     700     710     720
AACAAAGTGAAGCTGTACGAGCATGGGGTTGCTCGCTATTCTCCGTTGCCCAAGTCAGGC
N K V K L Y E H G V A R Y S P L P K S G

     730     740     750     760     770     780
CTGGTAGAGGTTCAAGGGAAAGCCATAATGACTGCATAGATAAACATGTAGTGAAGACCA
L V E V Q G K A I M T A *

     790     800     810     820     830     840
CATACTCGGGATTAGAGTTTAGGGATTGGTAGTTGTGGTAGATTCTAGCCTACAAATTTT

```

TTGGG 3' (SEQ ID NO:03 & 04)



Figure 10

Red fluorescent protein from *Zoanthus* sp. zoanRFP

```

      10      20      30      40      50      60
GAGTTGAGTTCTCGACTTCAGTTGTATCACTTTTGACGTATCAAGTGATCTATTCTCAAC

      70      80      90     100     110     120
ATGGCCCATTCAAAGCACGGACTAACAGATGACATGACAATGCATTTCCGTATGGAAGGG
M A H S K H G L T D D M T M H F R M E G

     130     140     150     160     170     180
TGCCTCGATGGACATAAGTTTGTAAATCGAGGGCAACGGCAATGGAAATCCTTTCAAAGGG
C V D G H K F V I E G N G N G N P F K G

     190     200     210     220     230     240
AAACAGTTTATTAATCTGTGTGTGATTGAAGGAGGACCACTGCCATTCTCCGAAGACATA
K Q F I N L C V I E G G P L P F S E D I

     250     260     270     280     290     300
TTGTCTGCTGCGTTTGACTACGGAAACAGGCTCTTCACTGAATATCCTGAAGGCATAGTT
L S A A F D Y G N R L F T E Y P E G I V

     310     320     330     340     350     360
GACTATTTCAAGAACTCGTGTCTGCTGGATATACGTGGCACAGGTCTTTTCGCTTTGAA
D Y F K N S C P A G Y T W H R S F R F E

     370     380     390     400     410     420
GATGGAGCAGTTTGCATATGCAGTGCAGATATAACAGTAAATGTTAGGGAAAACCTGCATT
D G A V C I C S A D I T V N V R E N C I

     430     440     450     460     470     480
TATCATGAGTCCACGTTTTATGGAGTGAACCTTTCCTGCTGATGGACCTGTGATGAAAAAG
Y H E S T F Y G V N F P A D G P V M K K

     490     500     510     520     530     540
ATGACAATAATTGGAACCGTCTGCGAGAAAATCATACCAATAAATAGTCAGAAGATA
M T T N W E P S C E K I I P I N S Q K I

     550     560     570     580     590     600
TTAAAAGGGGATGTCTCCATGTACCTCCTTCTGAAGGATGGTGGGCGTTACCGCTGCCAG
L K G D V S M Y L L L K D G G R Y R C Q

     610     620     630     640     650     660
TTTGACACAATTTACAAAGCAAAGACTGAGCCAAAAGAAATGCCGGACTGGCACTTCATC
F D T I Y K A K T E P K E M P D W H F I

     670     680     690     700     710     720
CAGCATAAGCTCAACCGTGAAGACCGCAGCGATGCTAAGAATCAGAAATGGCAACTGATA
Q H K L N R E D R S D A K N Q K W Q L I

     730     740     750     760     770     780
GAACATGCTATTGCATCCCGATCTGCTTTACCCTGATAACAAAGGAGTTGCTATTGCATG
E H A I A S R S A L P *

     790     800     810     820     830     840
TGCATGCCTATTACGCTGATAAAAATGTAGTTTAAACATGCAATTGTATGTGCATGCACA

     850
TTACCCTGATA

```

(SEQ ID NOS:05 & 06)

Figure 11

Green fluorescent protein from *Scolymia cubensis* scubGFP1 (AY037767)

```

      10      20      30      40      50      60
5'TGTGACATTTCAGTCATATAGGAGCCTCTATCGGAGCTGAGGTCCCATTACCGTTGTGAT
      70      80      90     100     110     120
TTGGACGGGAGCAGATCGAGAACACMAGGGCTGTACGAGTCTGATAATTACTTTACAT
      130     140     150     160     170     180
CTACCAACATGCAGCGTGTGGGATGAAGGTTAAGGAACATATGAAGATCAAACGCGTA
      M Q R A G M K V K E H M K I K L R M

      190     200     210     220     230     240
TGGGAGGTACTGTAAACGGAAAGCATTTCGCGGTTAATGGGACAGGAGACGGCTACCCCTT
      G G T V N G K H F A V N G T G D G Y P Y

      250     260     270     280     290     300
ATCAGGAAAACAGATTTTGAAACTTATCGTCGAAGGCAGCGAACCTCTGCCTTTCGCTT
      Q G K Q I L K L I V E G S E P L P F A F

      310     320     330     340     350     360
TTGATATCTTGTGACGAGCATTCCAGTATGGCAACAGGGCATTACCCGAATACCCAACAG
      D I L S A A F Q Y G N R A F T E Y P T E

      370     380     390     400     410     420
AGATAGCAGACTATTTTCAAGCAGTCGTTTGTAGTTTGGCGAGGGGTTCTCCTGGGAACGAA
      I A D Y F K Q S F E F G E G F S W E R S

      430     440     450     460     470     480
GTTTCACTTTTCGAAGATGGGGCCATTTCGCTGCCACCAACGATATAACGATGGTTGGTG
      F T F E D G A I C V A T N D I T M V G G

      490     500     510     520     530     540
GTGAGTTTCAGTATGATATTCGATTGTGATGGTCTGAACTTCCTGAAGATGGTCCAGTGA
      E F Q Y D I R F D G L N F P E D G P V M

      550     560     570     580     590     600
TGCAAAAGAAAACCGTAAATGGGAGCCATCCACTGAGATAATGTATATGCAAAATGGAG
      Q K K T V K W E P S T E I M Y M Q N G V

      610     620     630     640     650     660
TGCTGAAGGGTGAGGTTAACATGGCTCTGTTGCTTCAAGACAAAAGCCATTACCGTTGCG
      L K G E V N M A L L L Q D K S H Y R C D

      670     680     690     700     710     720
ACCTCAAACTACTTACAAAGCTAAGAATAATGTGCCGCATCCTCCAGGCTACCACTATG
      L K T T Y K A K N N V P H P P G Y H Y V

      730     740     750     760     770     780
TGGATCACTGCATTGAAATACTCGAAGAACGTAAGGATCACGTTAAGCTGCGGGAGCATG
      D H C I E I L E E R K D H V K L R E H A

      790     800     810     820     830     840
CTAAAGCTCGTTCTAGCCTGTCACCTACCACTGCAAAAGAACGAAAGGCTTAGGTGATAG
      K A R S S L S P T S A K E R K A *

      850     860     870     880     890     900
TCAAAAAGACAACAAGACGAAAATGAAAGGTGTTTCATTGTTAGAATTTGATATTTTCGAT
      910     920     930     940     950     960
TCAATGATTCGTTAAGGGATTGCTAGAGGCTAGCTAACAGGTTAACATCATAAGGATAG
      970     980     990     1000    1010    1020
AGATTTCGTTGCGGAGTTAGAACCTTATATTTTCCGAATCCAMCTAGAGTCGTTGAGA
      1030    1040    1050    1060    1070    1080
AATTTATTAGAGACTAGCTTTAGAGTTACTTTTGTGGAAGGTTTCCATTTTTCG
      1090    1100    1110    1120    1130    1140
GTTATTACAGCATTTAAAGCATAGGAATAGAGATTTCGGTTATGGAAAATAACAGTAGGAA
      1150    1160    1170
AATACGTTGTGAAAATAAACTTGTGTGCGAAAAAAA 3'

```

(SEQ ID NOS:07&08)

FIGURE 12

Green fluorescent protein from *Scolymia cubensis* scubGFP2 (AY037771)

```

      10      20      30      40      50      60
5'CCTGGTGATTGGACGAGAGCAGATCGAGAATAGCAAGGTTTTACCAGCGTGATAATTTA
      70      80      90     100     110     120
CTTTACATCTAACACATGCAATCTGCTGGGAAGAAGAAATGTCGTTAAGGACTTCATGAA
      M Q S A G K K N V V K D F M K

      130     140     150     160     170     180
GATCACACTGCGTATGGACGGTGCTGTAAACGGGAAGCCCTTCGCGGTTAATGGAACAGG
      I T L R M D G A V N G K P F A V N G T G

      190     200     210     220     230     240
AGATGGCAACCCCTTATGGTGAATACAGAGTTTGAAGCTTACCGTCGATGGCAACAAACC
      D G N P Y G G I Q S L K L T V D G N K P

      250     260     270     280     290     300
TCTGCCTTTTGCTTTTGATATCTTGTGAGCAGCATTCAGTATGGCAACAGGGCATTAC
      L P F A F D I L S A A F Q Y G N R A F T

      310     320     330     340     350     360
CGAATACCCAAAAGAGATATCAGACTATTTCAAGCAGTCGTTGAGTTTGGCGAGGGGTT
      E Y P K E I S D Y F K Q S F E F G E G F

      370     380     390     400     410     420
TACCTGGGAACGAAGTTTCACTTTTGAAGACGGGGCCATTTGCGTCGCCACGAACGATAT
      T W E R S F T F E D G A I C V A T N D I

      430     440     450     460     470     480
AAAGATGGTTGGCGATGAGTTTCAATATAACATTCGATTGTGGTGTGAATTTCCCTGA
      K M V G D E F Q Y N I R F D G V N F P E

      490     500     510     520     530     540
AGATGGTCCWGTATGCAGAAGAAAACGGTGAAAGTGGGAGCCATCCACAGAGATAATGCG
      D G P V M Q K K T V K W E P S T E I M R

      550     560     570     580     590     600
TGTGCAAGGTGGAGTGCTAAAGGGTGAGGTTAATGCGCTCTGTTGCTTAAAGACAAAAG
      V Q G G V L K G E V N M A L L L K D K S

      610     620     630     640     650     660
CCATTACCGATGTGACTTCAAACTACTTACAAAGCTAAGAATCCTGTCCCGCCGACGGC
      H Y R C D F K T T Y K A K N P V P P T A

      670     680     690     700     710     720
GCTTCCAGACTACCACTATGTGGATCACTGTATTGAAATCACCGAGGAAAATAGGGATTA
      L P D Y H Y V D H C I E I T E E N R D Y

      730     740     750     760     770     780
CGTTAAGCTGCAGGAGTATGCTAAAGCTCGTTCTGGCCTGCACCTGCCCCGAAGTGC AAAA
      V K L Q E Y A K A R S G L H L P E L Q K

      790     800     810
GTAAAGGCTTAGGCGATAGTCAAGACGACAACGAGAAGA 3'

```

(SEQ ID NO:09 & 10)

FIGURE 13

Red fluorescent protein from *Ricordea florida* rflorFP (AY037773)

```

      10      20      30      40      50      60
5'TGTGAAAGTTAACATTTTACTTTTACTTCTACCAGCATGAGTGCACCTCAAAGAGGAAATGA
      M S A L K E E M K

      70      80      90     100     110     120
AAATCAAGCTTACATTGGTGGGCGTTGTTAACGGGCACCCATTCAAGATCATTGGGGACG
      I K L T L V G V V N G H P F K I I G D G

      130     140     150     160     170     180
GAAAAGGCAAACCTATGAGGGATCGCAGGAATTAACCCCTTGCCGTGGTGAAGGAGGGC
      K G K P Y E G S Q E L T L A V V E G G P

      190     200     210     220     230     240
CTCTGCCCTTTCTCTTATGATATCCTGACAACGATAGTTCACTATGGCAACAGGGCATTG
      L P F S Y D I L T T I V H Y G N R A F V

      250     260     270     280     290     300
TGAATACCCAAAGGACATACCAGATATTTTCAAGCAGACCTGCTCTGGTCTGGTGCTG
      N Y P K D I P D I F K Q T C S G P G A G

      310     320     330     340     350     360
GATATTCCTGGCAAAGGACCATGAGTTTTGAAGACGGAGGCGTTTGCACTGCTACGAGCC
      Y S W Q R T M S F E D G G V C T A T S H

      370     380     390     400     410     420
ATATCAGGGTGGGACACTTTCAATTATGACATTCACCTTCATGGGAGCGGATTTC
      I R V D G D T F N Y D I H F M G A D F P

      430     440     450     460     470     480
CTCTTAATGGTCCAGTGATGCAGAAAAGAACAGTGAATGGGAGCCATCCACTGAGATAA
      L N G P V M Q K R T V K W E P S T E I M

      490     500     510     520     530     540
TGTTTCAATGTGATGGATTGCTGAGGGGTGATGTTGCCATGTCTCTGTTGCTGAAAGGAG
      F Q C D G L L R G D V A M S L L L K G G

      550     560     570     580     590     600
GCGGCGATTACCGATGTGACTTTAAACTATTTATAAACCCAAGAAGAATGTCAAGATGC
      G H Y R C D F K T I Y K P K K N V K M P

      610     620     630     640     650     660
CAGGTTACCATTTTGTGGACCACTGCATTGAGATAACGAGTCAACAGGACGATTACAACG
      G Y H F V D H C I E I T S Q Q D D Y N V

      670     680     690     700     710     720
TGGTTGAGCTGTACGAGGGTGCTGTAGCCCACTACTCTCCTCTGCAGAAACCATGCCAAG
      V E L Y E G A V A H Y S P L Q K P C Q A

      730     740     750     760     770     780
CAAAGGCATAAAGCCAAACAACCCAAGAGGACAACAAGACATTTAATCAAATCACATCTT
      K A *

      790     800
TGTATTTTGGTTAGAGTTGAAAAAAA 3'

```

(SEQ. ID NO:11 & 12)

FIGURE 14

Green fluorescent protein from *Ricordea florida* rfloGFP (AY037772)

```

      10      20      30      40      50      60
5'AGTCACCTCGGTGTTTTAGGACAGGAAGGATCACGAGCAAGAGAAGAACTGTGAAAGTT
      70      80      90     100     110     120
AACACTTTACTCTACTTCTACCAGCATGAGTGCACCTCAAAGAGGAAATGAAAATCAAGCT
      M S A L K E E M K I K L

      130     140     150     160     170     180
TAAATGGTGGGCGTTGTTAACGGGCAGTCATTTCAGATCGATGGGGAAGGAAAAGGCAA
      K M V G V V N G Q S F Q I D G E G K G K

      190     200     210     220     230     240
ACCTTACGAGGGATCACAGAAATTAACCCCTGAAGTGGTGAAGGAGGGCCTCTGCTCTT
      P Y E G S Q K L T L E V V E G G P L L F

      250     260     270     280     290     300
CTCTTATGATATCCTGACAACGATATTTTCAGTATGGCAACAGGGCATTCTGTAACCTACC
      S Y D I L T T I F Q Y G N R A F V N Y P

      310     320     330     340     350     360
AAAGGACATACCAGATATTTTCAAGCAGACCTGCTCTGGTCTGATGGTGGATTTCCTG
      K D I P D I F K Q T C S G P D G G F S W

      370     380     390     400     410     420
GCAAAGGACCATGACTTATGAAGACGGAGGGGTTGCACTGCTTCAAACCATCAGCGT
      Q R T M T Y E D G G V C T A S N H I S V

      430     440     450     460     470     480
GGACGGCGACACTTTTTATTATGTGATAAGATTTAATGGAGAGAATTTCTCCAAATGG
      D G D T F Y Y V I R F N G E N F P P N G

      490     500     510     520     530     540
TCCAGTAATGCAGAAAAGACAGTGAAATGGGAGCCATCCACTGAGATAATGTTTGAACG
      P V M Q K R T V K W E P S T E I M F E R

      550     560     570     580     590     600
TGATGGATTGCTGAGGGGTGACATTGCCATGTCTCTGTTGCTGAAAGGAGGCGGCCATTA
      D G L L R G D I A M S L L L K G G G H Y

      610     620     630     640     650     660
CCGATGTGACTTTAAACTATTTATACACCCAAGAGGAAGGTCAACATGCCAGGTTACCA
      R C D F K T I Y T P K R K V N M P G Y H

      670     680     690     700     710     720
TTTTGTGGACCACTGCATTGAGATACAGAAGCAGACAAGGATTACAACATGGCTGTGCT
      F V D H C I E I Q K H D K D Y N M A V L

      730     740     750     760     770     780
CTCTGAGGATGCTGTAGCCCAACTCTCCTCTGGAGAAAAAAGCCAAGCAAAGGCGTA
      S E D A V A H N S P L E K K S Q A K A *

      790
AAGCCAAACAACCTAA 3'

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(SEQ ID NO:13&14)

Figure 15

Red fluorescent protein from *Montastraea cavernosa* mcavRF? (AY037770)

```

      10      20      30      40      50      60
5'ACGCAGGGATTACCCCTGGTGATTGGGAAGAGAGACGACCGAGAACAACAAGAGCTGTAT
      70      80      90     100     110     120
AAGGCTGATATCTTACTTTACGTCTACCATCATGAGTGTGATTAAATCAGTCATGAAGAT
R L I S Y F T S T I M S V I K S V M K I

      130     140     150     160     170     180
CAAGCTGCGTATGGAAGGCAGTGTAACGGGCACAACCTTCGTAATTGTTGGAGAAGGAGA
K L R M E G S V N G H N F V I V G E G E

      190     200     210     220     230     240
AGGCAAGCCTTATGAGGGAACACAGAGTATGGACCTTACAGTCAAAGAAGGCGCACCTCT
G K P Y E G T Q S M D L T V K E G A P L

      250     260     270     280     290     300
GCCTTCGCCTACGATATGACAACAGTATTCCATTACGGCAATAGGGTATTTCGCAA
P F A Y D I M T T V F H Y G N R V F A K

      310     320     330     340     350     360
ATACCCAAAACATATCCCAGACTATTTCAAGCAGATGTTTCCTGAGGAGTATTCCTGGGA
Y P K H I P D Y F K Q M F P E E Y S W E

      370     380     390     400     410     420
ACGAAGCATGAATTTGGAAGGCGGGGGCATTTCACCGCCAGGAACGAGATAACAATGGA
R S M N F E G G G I C T A R N E I T M E

      430     440     450     460     470     480
AGGCGACTGTTTTTTCAATAAAGTTCGATTGATGGTGTGAACCTCCCCCCTAATGGTCC
G D C F F N K V R F D G V N F P P N G P

      490     500     510     520     530     540
AGTCATGCAGAAGAAGACGCTGAAATGGGAGCCATCCACTGAAAAATGTATGTGCGTGA
V M Q K K T L K W E F S T E K M Y V R D

      550     560     570     580     590     600
TGGAGTGTGACGGGTGATATCAACATGGCTTTGTTGCTTGAAGGAGGTGGCCATTACCG
G V L T G D I N M A L L L E G G G H Y R

      610     620     630     640     650     660
ATGTGACTTCAGAACTACTTACAGAGCTAAGAAGAAGGGTGTCAAGTTACCAGATTATCA
C D F R T T Y R A K K K G V K L P D Y H

      670     680     690     700     710     720
CTTTGAGGATCACTCCATTGAGATTTTGCGCCATGACAAAGAATACACTGAGGTAAAGCT
F E D H S I E I L R H D K E Y T E V K L

      730     740     750     760     770     780
GTATGAGCATGCCAAGCTCATTCTGGGCTGCCGAGGGTGGCAAAGTAAAGGCTTAACGA
Y E H A E A H S G L P R V A K *

      790
AAAGCCAAGACCACA 3'

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(SEQ ID NO:15 & 16)

FIGURE 16

Green fluorescent protein from *Montastraea cavernosa* mcavGFP (AY037769)

```

      10      20      30      40      50      60
5'ATTCGCCCTGGTGATTTGGAGAGAGCAGATCGAGAACAAAGAGCTGTAAGGTTGATA
      70      80      90     100     110     120
TCTTACTTACGCTTACCATCATGACAAGTGTTCACAGGAAAAGGGTGTGATTAACCAG
      M T S V A Q E K G V I K P D

      130     140     150     160     170     180
ACATGAAGATGAAGCTGCGTATGGAAGGTGCTGTAACGGGCACAAGTTCGTGGTTGAAG
      M K M K L R M E G A V N G H K F V V E G

      190     200     210     220     230     240
GAGATGGAAAAGGAAGCCTTTCGACGGAACACAGACTATGGACCTTACAGTCATAGAAG
      D G K G K P F D G T Q T M D L T V I E G

      250     260     270     280     290     300
GCGCACCATTCGCTTTTCGCTTACGATATCTTGACAACAGTATTCGATTACGGCAACAGGG
      A P L P F A Y D I L T T V F D Y G N R V

      310     320     330     340     350     360
TATTCGCCAAATACCCAGAAGACATAGCAGATTATTTCAAGCAGACGTTTCCTGAGGGGT
      F A K Y P E D I A D Y F K Q T F P E G Y

      370     380     390     400     410     420
ACTTCTGGGAACGAAGCATGACATACGAAGACCAGGGCATTTCATCGCCACAAACGACA
      F W E R S M T Y E D Q G I C I A T N D I

      430     440     450     460     470     480
TAACAATGATGGAAGGCGTCGACGACTGTTTTGCCTATAAAATTCGATTGATGGTGTGA
      T M M E G V D D C F A Y K I R F D G V N

      490     500     510     520     530     540
ACTTTCTGCCAATGGTCCAGTTATGCAGAGGAAGACGCTGAAATGGGAGCCATCCACTG
      F P A N G P V M Q R K T L K W E F S T E

      550     560     570     580     590     600
AGATAATGTATGCGCGTGATGGAGTGCTGAAGGGTGATGTTAACATGGCTCTGTTGCTTG
      I M Y A R D G V L K G D V N M A L L L E

      610     620     630     640     650     660
AAGGAGGTGGCCATTACCGATGTGACTTCAAACACTACTTACAAAGCTAAGAAGGTTGTCC
      G G G H Y R C D F K T T Y K A K K V V R

      670     680     690     700     710     720
GGTTGCCAGACTATCACTTTGTGGACCATCGCATTGAGATTGTGAGCCACGACAAAGATT
      L P D Y H F V D H R I E I V S H D K D Y

      730     740     750     760     770     780
ACAACAAGGTTAAGCTGCACGAGCATGCCGAAGCTCGTCATGGACTGTCAAGGAAGGCCA
      N K V K L H E H A E A R H G L S R K A K

      790     800     810     820     830     840
AGTAAAGGCTTAATGAAAAGTCAAGACGACAACGAGGAGAAACAAAGTACTTTTTTGTTA
      *

      850     860     870     880     890     900
AATTTGAAGGCATTTACTCGGAATTAGTATTTGATACTTTTCGATTCAAGGATTGTTCCG
      910     920     930     940     950     960
GGATTTGTTAGAGACTAGCTCTAGAGTTGTATTTTGTAAGAAAAGATAGTTTCCAGTTT
      970     980     990     1000    1010    1020
TGCGGGATTACAGCATGGGGATAGACTTTTAAACTCAGTTGTGGTCAAATGCAAGTAAG
      1030    1040    1050    1060
AAAACTGTAGTGAGAATAAACTTGTATCGAAGCCGAAAAA 3'

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(SEQ ID NOS: 17 &amp; 18)

Figure 17

Green fluorescent protein from *Condylactis gigantea* cgigGFP (AY037776)

```

      10      20      30      40      50      60
5'ACAGCTGTTTCATCCACGCTCATTCAAGACGCCGTCAACTTTATTCCAGTCAGGAAAATGT
                                     M Y

      70      80      90     100     110     120
ATCCTTGGATCAAGGAAACCATGCGCAGTAAGGTTTACATGGAAGGAGATGTTAACAACC
P W I K E T M R S K V Y M E G D V N N H

     130     140     150     160     170     180
ACGCCTTCAAGTGCACCTGCGAGTAGGAGAAGGAAAACCATACAAAGGCTCACAGACCTGA
A F K C T A V G E G K P Y K G S Q D L T

     190     200     210     220     230     240
CGATTACCGTCACTGAAGGAGGTCCTCTGCCATTTGCTTTTCGACATTCTTTTCACACGCCT
I T V T E G G P L P F A F D I L S H A F

     250     260     270     280     290     300
TTCAGTATGGCAACAAGGTGTTCCACCGATTACCCCGACGATATTCCTGATTTCTTTAAGC
Q Y G N K V F T D Y P D D I P D F F K Q

     310     320     330     340     350     360
AGTCTCTCTCGGATGGTTTTACTTGGAGAAGAGTAAGCACSTATGACGATGGAGGAGTCC
S L S D G F T W R R V S T Y D D G G V L

     370     380     390     400     410     420
TCACAGTTACCCAAGACACTAGTCTGAAGGAGATTGCATTATTTGCAACATTAAAGTCC
T V T Q D T S L K G D C I I C N I K V H

     430     440     450     460     470     480
ATGGCACTAACTTCCCCGAAAATGGTCCGGTGATGCAAAACAAGACCGATGGATGGGAGC
G T N F P E N G P V M Q N K T D G W E P

     490     500     510     520     530     540
CATCCAGCACTGAAACGGTTATTCCACAAGATGGAGGAATTGTTGCTGCGCGATCACCCG
S S T E T V I P Q D G G I V A A R S P A

     550     560     570     580     590     600
CACTAAGGCTGCGTGATAAAGGTCATCTTATCTGCCACA'TGGAAACAACCTTACAAGCCAA
L R L R D K G H L I C H M E T T Y K P N

     610     620     630     640     650     660
ACAAAGAGGTGAAGCTGCCAGAACTCCACTTTCATCATTTGCGAATGGAAAAGCTGAGTG
K E V K L P E L H F H H L R M E K L S V

     670     680     690     700     710     720
TTAGTGACGATGGGAAGACCATTAAAGCAGCACGAGTATGTGGTGGCTAGCTACTCCAAG
S D D G K T I K Q H E Y V V A S Y S K V

     730     740     750     760     770     780
TGCCTTCGAAGATAGGACGTCAATGATCATTTCCTTATTAAATATCAATGATGTGGCTT
P S K I G R Q *

     790     800     810     820     830     840
TCAATTTTCCAAAATTTTGTAAAGACATAGGTCTTTTGGATTTTGGTAACCCCAACCTT
     850     860     870     880     890
AATTCCCAATAATTTTGTGTGGAAAGTCAAATAAAACCAGCCTTCCCTGGGCCTTTAA 3'

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(SEQ ID NOS: 19 & 20)



FIGURE 18

Green fluorescent protein from *Agaricia fragilis* afraGFP (AY037765)

```

      10      20      30      40      50      60
5'CAAGGAAGCCAAATCTTTTACCAGAGATCTCGCGTGAAAGCAACCTATGAGTGATGGCGA
                                     M A I

      70      80      90     100     110     120
TTTCTACTCTAAAGAACGTATCATCATCGTTATTATATACTCCTGCAGCACTTGTGCTG
  S T L K N V I I I V I I Y S C S T C A V

      130     140     150     160     170     180
TTTGGTCGAATTCAAACCTCTGAATCCTCTTTCACTAATGGGATTGCAGAGGAAATGAAGA
  W S N S N S E S S F T N G I A E E M K T

      190     200     210     220     230     240
CTAGGGTACATTTGGAGGGTACTGTAAACGGGCACTCCTTTACAATTAAGGCGAAGGAA
  R V H L E G T V N G H S F T I K G E G R

      250     260     270     280     290     300
GAGGCTACCCTTACAAGGAGAACAGTTTATGAGCCTTGAGGTCGTCATGGTGCTCCTC
  G Y P Y K G E Q F M S L E V V N G A P L

      310     320     330     340     350     360
TGCCGTTCTCTTTTGATATCTTGACACCAGCATTTATGTATGGCAACAGAGTGTTCACCA
  P F S F D I L T P A F M Y G N R V F T K

      370     380     390     400     410     420
AGTACCCACCAAAACATACCAGACTATTTCAAGCAGACGTTTCCTGAAGGGTATCACTGGG
  Y P P N I P D Y F K Q T F P E G Y H W E

      430     440     450     460     470     480
AAAGAAACATTCCTTTGAAGATCAGGCCGCGTGACGGTAACCAGCCACATAAGATTGG
  R N I P F E D Q A A C T V T S H I R L E

      490     500     510     520     530     540
AAGAGGAAGAGAGGCGTTTTGTAAATAACGTCAGATTCACTGTGTGAACCTTTCCCCCTA
  E E E R R F V N N V R F H C V N F P P N

      550     560     570     580     590     600
ATGGTCCAGTCATGCAGAGGAGGATACTGAAATGGGAGCCATCCACTGAGAACATTTATC
  G P V M Q R R I L K W E P S T E N I Y P

      610     620     630     640     650     660
CGCGTGATGGGTTTCTGGAGGGCCATGTTGATATGACTCTTCGGGTTGAAGGAGGTGGCT
  R D G F L E G H V D M T L R V E G G G Y

      670     680     690     700     710     720
ATTACCGAGCTGAGTTCAAAAGTACTTACAAAGGGAAGACCCAGTCCGCGACATGCCAG
  Y R A E F K S T Y K G K T P V R D M P D

      730     740     750     760     770     780
ACTTTCACTTCATAGACCACCGCATTGAGATTACGGAGCATGACGAAGACTACACCAATG
  F H F I D H R I E I T E H D E D Y T N V

      790     800     810     820     830     840
TTGAGCTGCATGACGTATCCTGGGCTCGTTACTCTATGCTGCCGACTATGTAAGCGGAAA
  E L H D V S W A R Y S M L P T M

      850     860     870     880     890     900
AGGCAAGGCAACAAGACGCAAAACCGCCCTGTTGTCTCTTTTCATAAGAGATTGACAA
      910     920     930     940     950     960
CCGTGGTTCTTTGCCATTTAATTGAATTAGTTTAAATTAAATCTTTGGGATTGATGTAG
      970     980     990    1000    1010    1020
ACGCTTTGGTTGCTAAGTAAGAAAACATTTGTGATTATTAAATTTGTTGCCTGAAGCAAA
      1030
AAAAAAAAA 3'
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(SEQ ID NOS:21 &amp; 22)

FIGURE 19

Green fluorescent protein from *Ricordea florida* rfloGFP2 (AY037774)

```

      10      20      30      40      50      60
5'AGCCACTTCGGTGTCTTGTGCGAGAGGAAGGATCACGAACAAGAGAAGAGCTGTAAAAGTT
      70      80      90     100     110     120
AAAATTTTACTTTACTTCTTCCAGCATGAATGCACTTCAAGAGGAAATGAAAATCAAGCT
      M N A L Q E E M K I K L

      130     140     150     160     170     180
TACAATGGTGGGCGTTGTAAACGGGCAGTCATTTAAGATCGATGGGAAAGGAAAAGGGAA
      T M V G V V N G Q S F K I D G K G K G K

      190     200     210     220     230     240
ACCTTACGAGGGATCACAGGAATTGACCCTTAAAGTGGTGGGAAGGCGGCCCTCTGCTCTT
      P Y E G S Q E L T L K V V E G G P L L F

      250     260     270     280     290     300
CTCTTATGATATCCTGACAACGATATTTTCAAGTATGGCAACAGGGCATTCGTGAACTACCC
      S Y D I L T T I F Q Y G N R A F V N Y P

      310     320     330     340     350     360
AAAGGACATACCAGATATTTTCAAGCAAACGTGTTCTGGTCTTGATGGCGGATATTCGTG
      K D I P D I F K Q T C S G L D G G Y S W

      370     380     390     400     410     420
GCAAAGGACCATGACTTATGAGGACGGAGGGGTTTGTACTGCTACAAGCAACGTCAGCGT
      Q R T M T Y E D G G V C T A T S N V S V

      430     440     450     460     470     480
GGTCGGCGACACTTTCAATTATGAAATTCACCTTTATGGGGGCGAATTTCTCTCAAATGG
      V G D T F N Y E I H F M G A N F P P N G

      490     500     510     520     530     540
TCCRGATGAGCAAGAAAGAACAGTGAAGTGGGAGCCCTCCACTGAGATAATGTTTGAACG
      P V M Q K R T V K W E P S T E I M F E R

      550     560     570     580     590     600
TGATGGATTGCTGAGGGGTGATGTTCCCATGCTCTCTGTTGCTGAAAGGAGGCGACCATTA
      D G L L R G D V P M S L L L K G G D H Y

      610     620     630     640     650     660
CCGATGTGACTTTTAAACTATTTTATAAACCAACAAGAAGGTCAAGCTGCCAGGTTACCA
      R C D F K T I Y K P N K K V K L P G Y H

      670     680     690     700     710     720
TTTGTGGACCACTGCATTGAGATAAAGAGTCAAGAGAATGATTACAACATGGTTGCGCT
      F V D H C I E I K S Q E N D Y N M V A L

      730     740     750     760     770     780
CTTTGAGGATGCTGTAGCACACTACTCTCCTCTGGAGAAAAAGAGCCAGGCAAAGGCGTA
      F E D A V A H Y S P L E K K S Q A K A *

      790     800     810     820     830     840
AATCCAAACAACCTAAGAAGACGACAAGGCATTCAATCTAATCGCATGTTTGAATTTTGT
      850     860     870     880     890     900
GTTAGGAATGTGTTGGGTCAGACTAGGTCTAGAACGTTTCATTTTGGCTGGATTGTTTTT
      910     920     930     940     950     960
ACTCAGTTATAGACAAGAAAAAATCTTAAATGACTTGGGTTGGATTAGCTTTTCGGGCAC
      970     980     990    1000    1010    1020
TGTCATTCGGATTCTTAGAAATATTTGAGACCAAGCCTTTTTTTTGAGCTGAGAACGT

AATC 3'

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(SEQ ID NOS: 23 &amp; 24)

FIGURE 20

Green fluorescent protein from *Montastraea cavernosa* mcavGFP2 (AY037768)

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      10      20      30      40      50      60
5'AGAGCTGTAGGGTGATATCTTACTTACGTCTACCATCATGACCAGTGTTCACAGGAAAA
      M T S V A Q E K

      70      80      90     100     110     120
GGTGTGATTAAACCAGACATGAAGATGAAGCTGCGTATGGAAGGTGCTGTAAACGGGCA
      G V I K P D M K M K L R M E G A V N G H

      130     140     150     160     170     180
CAAGTTCGTGATTGAAGGAGATGAAAAGGGAAGCCTTTCGACGGAACACAGACTATGGA
      K F V I E G D G K G K P F D G T Q T M D

      190     200     210     220     230     240
CCTTACAGTCATAGAAGGCGCACCATTGCCTTTCGCTTACGCTATCTTGACAACAGTATT
      L T V I E G A P L P F A Y A I L T T V F

      250     260     270     280     290     300
CGATTACGGCAACAGGGTATTCGCCAAATACCCAGAAGACATAGCAGATTATTTCAAGCA
      D Y G N R V F A K Y P E D I A D Y F K Q

      310     320     330     340     350     360
GACATTTCTGAGGGGTACTTCTGGAACGAAGCATGACATACGAAGACCAGGGCATTTC
      T F P E G Y F W E R S M T Y E D Q G I C

      370     380     390     400     410     420
CATCGCCACAACGACATAACAATGATGAAAGGCGTCGACGACTGTTTTGTCTATAAAAT
      I A T N D I T M M K G V D D C F V Y K I

      430     440     450     460     470     480
TCGATTTGATGGTGTGAACCTTCCTGCCAATGGTCCAGTTATGCAGAGGAAGACGCTGAA
      R F D G V N F P A N G P V M Q R K T L K

      490     500     510     520     530     540
ATGGGAGCCATCCACTGAGAAAATGTATGCGCGTGATGGAGTGCTGAAGGGTGATGTTAA
      W E P S T E K M Y A R D G V L K G D V N

      550     560     570     580     590     600
CATGGCTCTGTTGCTGAAGGAGGTGGCCATTACCGATGTGACTTCAAAACTACTTACAG
      M A L L L E G G G H Y R C D F K T T Y R

      610     620     630     640     650     660
AGCTAAGAAGGTTGTCCAGTTGCCAGACTATCATTTTGTGGACCATCGCATTGAGATTGT
      A K K V V Q L P D Y H F V D H R I E I V

      670     680     690     700     710     720
GAGCCACGACAAAGATTACAACAAGGTTAAGCTGTATGAGCATGCCGAAGCTCATTCTGG
      S H D K D Y N K V K L Y E H A E A H S G

      730     740     750     760     770     780
GCTGCCGAGGCAGGCCAAGTAAAGGCTTAATGAAAAGCCAAGACGACAACAAGGAGAAAC
      L P R Q A K *

      790     800     810     820     830     840
AAAGTATTTTTTTGTTAAATTTCAAGGCATTTACTCGGAATTAGTATTTGATACTTTTCG
      850     860     870     880     890     900
ATTCAAGGATTTGTTTCGGGACTTGTAGAGACCAGCTCTAGAGTTGTATTTTGTGAAAA
      910
AAAGATAGTTTCC 3'

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(SEQ.ID NOS: 25 & 26)

FIGURE 21

Green fluorescent protein homolog from *Montastraea annularis* mannFP (AY037766)

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      10      20      30      40      50      60
5'TGGTTAACGCAGAGTCGCGGGGGTTCCTGGCTAATAATTGATTCTATTTTGGGTGTGAC
      70      80      90     100     110     120
  ATTCAGGTTTAAAGCAGCATCCTCAGTGCTGAGGTCTCATTACCCTGGTGATTGGAAG
      130     140     150     160     170     180
  AGAGCAGATCGAGAACACCAAGAGCTGTATTACGCTAAAATCTTACTGCCTCTACCACC
      190     200     210     220     230     240
  ATGAGTATGATTAAACCAGAAATGAAGATCAAGATGCGTATGGACGGTGCTGTAAACGGG
  M S M I K P E M K I K M R M D G A V N G

      250     260     270     280     290     300
  CACAAGTTCGTGATTACAGGGGAAGGAAGCGGCGAGCCTTTCGAGGGAAAACAGACTATG
  H K F V I T G E G S G E P F E G K Q T M

      310     320     330     340     350     360
  AACCTGACAGTCATAGACGGCGGACCTCTGCCTTTCGCTTTCGACATCTTGACAACAGCA
  N L T V I D G G P L P F A F D I L T T A

      370     380     390     400     410     420
  TTCGATTACGGCAMCAGGGTATTCGCCAAATACCCAGAAGACATCCAGACTATTTCAAG
  F D Y G X R V F A K Y P E D I P D Y F K

      430     440     450     460     470     480
  CAGTCGTTTCTGAGGGGTTTCTTGGGAACGAAGCATGACTTACGAAGACGGGGGCATT
  Q S F P E G F S W E R S M T Y E D G G I

      490     500     510     520     530     540
  TGCATCGCCACAAATGACATAAAAAATGGAAGGCGACTGCTTTTCCTATGAAATTCGATT
  C I A T N D I K M E G D C F S Y E I R F

      550     560     570     580     590     600
  GATGGGGTGAACCTTTCCTGCCAATAGTCCAGTTATGCAGAAGAAGACCGTGAAATGGGAG
  D G V N F P A N S P V M Q K K T V K W E

      610     620     630     640     650     660
  CCATGCAC TGRGAAATGTATGTGCGTGATGGAGTGCTTAAAGGTGGTCTTAACATGGCT
  P C T X E M Y V R D G V L K G G L N M A

      670     680     690     700     710     720
  CTGTTGCTTGAAGGAGGTGGCCATTTCCGATGTGACTTGAAAAC TACTTACAAAGCTAAG
  L L L E G G G H F R C D L K T T Y K A K

      730     740     750     760     770     780
  AAGGTTGTCCAGATGCCAGACTATCACTTTGTGAATCACCGACTTGAGATAACATGGCAT
  K V V Q M P D Y H F V N H R L E I T W H

      790     800     810     820     830     840
  GACGAGGATTACAACAATGTTAAGCTGTCTGAGCATGCAGAAGCTCATTCTGGACTGCCA
  D E D Y N N V K L S E H A E A H S G L P

      850     860     870     880     890     900
  AGGCAGGCCAAATAAAGGCTTGACGAAAAGCCAAAACGGCAAAGAGTACAAGAAAGTATA
  R Q A K *

      910     920     930     940     950     960
  TATAAATGTATATTTTCAACTGAAAGGCATTCCACTCGGAATTAGTATTTGATACTTTC
      970     980     990     1000    1010    1020
  AATTCAAGGATTTATTTTGGGATTTGCTAGCCACTAGCTTTATTGTTAAATTAAGTTAAA
      1030    1040    1050    1060    1070    1080
  GACGGTTTAGCATTTTTCGGTATTACAACATAGGCACAGACGTCTTAACCCCAAGTAGTG
      1090    1100    1110    1120    1130
  GTCAGGTACAAGTAAGAAAAC TTTGGTGAGAATAGACTTGTAGTCGAAAAAAA 3'

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(SEQ ID NOS:27 &amp; 28)